

WHAT IS CLAIMED IS:

1. A polymerizable composition comprising:

a binder polymer containing at least an acid group having an acid dissociation constant ( $pK_a$ ) of 5.5 or more and a radical addition polymerizable group; and

a radical-generating compound capable of generating a radical with light or heat.

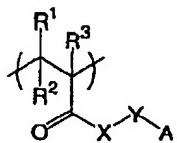
2. A polymerizable composition according to claim 1, wherein the acid group and the radical addition polymerizable group are introduced as a side chain of the binder polymer.

3. A polymerizable composition according to claim 1, wherein the acid group and the radical addition polymerizable group are introduced into terminal ends of a main chain of the binder polymer.

4. A polymerizable composition according to claim 1, wherein the  $pK_a$  of the acid group is in a range from 7 to 11.5.

5. A polymerizable composition according to claim 1, wherein the binder polymer comprises a structural unit that has the acid group and that is represented by the following general formula (1):

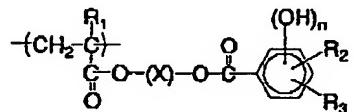
General formula (1)



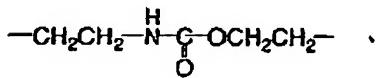
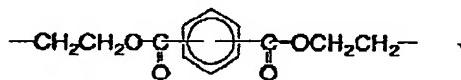
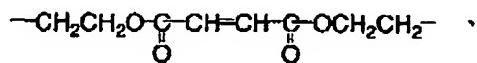
wherein in general formula (1), X represents O, S, or -NR<sup>4</sup>-; Y represents a divalent organic group; A represents a specific acid group; and each of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> independently represents a hydrogen atom, a halogen atom, a monovalent organic group, a cyano group, or a nitro group.

6. A polymerizable composition according to claim 1, wherein the binder polymer comprises a structural unit that has the acid group and that is represented by the following general formula (2):

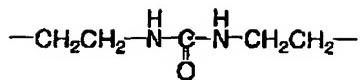
General formula (2)



wherein in general formula (2), X represents an alkylene group, a substituted alkylene group, -CH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>2</sub>-,



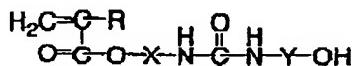
or



wherein R<sup>1</sup> represents a hydrogen atom, a halogen atom, or an alkyl group; each of R<sup>2</sup> and R<sup>3</sup> independently represents a hydrogen atom, a halogen atom, an alkyl group, a substituted alkyl group, an aromatic group, a substituted aromatic group, -OR<sup>4</sup>, -COOR<sup>5</sup>, -COONHR<sup>6</sup>, -COR<sup>7</sup>, or -CN; R<sup>2</sup> and R<sup>3</sup> may be bonded to each other to form a ring; each of R<sup>4</sup> to R<sup>7</sup> independently represents an alkyl group or an aromatic group; and n represents 2 or 3.

7. A polymerizable composition according to claim 1, wherein the binder polymer comprises a structural unit that has the acid group and that is represented by the following general formula (3):

General formula (3)

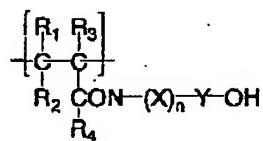


wherein in general formula (3), R represents a hydrogen atom or an alkyl group; X represents a divalent linking group; and Y represents a divalent aromatic group which may have substituents.

8. A polymerizable composition according to claim 1,

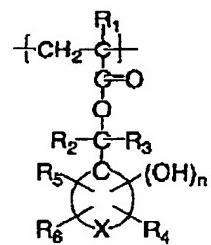
wherein the binder polymer comprises a structural unit that has the acid group and that is represented by the following general formula (4):

General formula (4)



9. A polymerizable composition according to claim 1, wherein the binder polymer comprises a structural unit that has the acid group and that is represented by the following general formula (5):

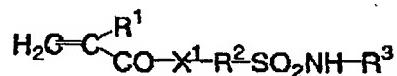
General formula (5)



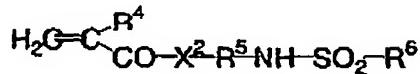
wherein in general formula (5), R<sub>1</sub> represents a hydrogen atom, a halogen atom, a cyano group, or an alkyl group; each of R<sub>2</sub> and R<sub>3</sub> independently represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, or an aryl group; Each of R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> independently represents a hydrogen atom, an alkyl group, an aryl group or a halogen atom; X represents an atom necessary for completing a monocyclic or polycyclic carbocyclic aromatic ring system; and n represents 1, 2 or 3.

10. A polymerizable composition according to claim 1, wherein the binder polymer comprises a structural unit that has the acid group and that is represented by one of the following general formulae (6) and (7):

General formula (6)



General formula (7)

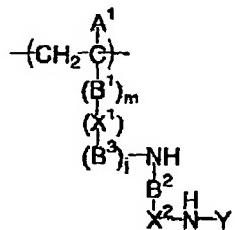


wherein in the above formulas, each of X<sup>1</sup> and X<sup>2</sup> independently represents -O- or -NR<sup>7</sup>-; each of R<sup>1</sup> and R<sup>4</sup> independently represents -H or -CH<sub>3</sub>; each of R<sup>2</sup> and R<sup>5</sup> independently represents an alkylene group, a cycloalkylene group, an arylene group or an aralkylene group each having from 1 to 12

carbon atoms and each of which may have substituents; R<sup>3</sup> represents -H or an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group each having from 1 to 12 carbon atoms and each of which may have substituents; R<sup>6</sup> represents an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group each having from 1 to 12 carbon atoms and each of which may have substituents; and R<sup>7</sup> represents a hydrogen atom or an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group each having from 1 to 12 carbon atoms and each of which may have substituents.

11. A polymerizable composition according to claim 1, wherein the binder polymer comprises a structural unit that has the acid group and that is represented by the following general formula (8):

General formula (8)

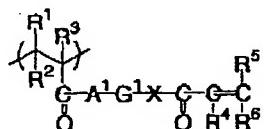


wherein in general formula (8), A<sup>1</sup> represents a hydrogen atom, a halogen atom, or an alkyl group having from 1 to 4 carbon atoms; B<sup>1</sup> represents a phenylene group or a substituted phenylene group; B<sup>2</sup> represents an alkylene group having from

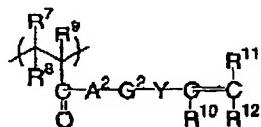
2 to 6 carbon atoms or a phenylene group, wherein each of which may have substituents; B<sup>1</sup> represents a divalent organic group; each of X<sup>1</sup> and X<sup>2</sup> independently represents -CO- or -SO<sub>2</sub>-; Y represents -CO-R<sup>1</sup> or -SO<sub>2</sub>-R<sup>1</sup>; R<sup>1</sup> represents an alkyl group, a substituted alkyl group, an aromatic group, or a substituted aromatic group; and each of m and j represents 0 or 1.

12. A polymerizable composition according to claim 1, wherein the binder polymer comprises at least one of a structural unit that includes the radical addition polymerizable group and that is represented by one of the following general formulae (9) to (11):

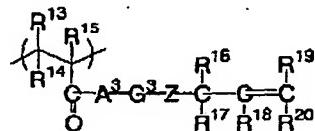
General formula (9)



General formula (10)



General formula (11)



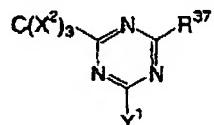
wherein in the above formulas, each of A<sup>1</sup>, A<sup>2</sup> and A<sup>3</sup> independently represents an oxygen atom, a sulfur atom, or -N(R<sup>21</sup>)-; R<sup>21</sup> represents a hydrogen atom or an alkyl group which may have substituents; each of G<sup>1</sup>, G<sup>2</sup> and G<sup>3</sup> independently represents a divalent organic group; each of X and Z independently represents an oxygen atom, a sulfur atom, or -N(R<sup>22</sup>)-; R<sup>22</sup> represents a hydrogen atom or an alkyl group which may have substituents; Y represents an oxygen atom, a sulfur atom, a phenylene group which may have substituents, or -N(R<sup>23</sup>)-; R<sup>23</sup> represents an alkyl group which may have substituents; and each of R<sup>1</sup> to R<sup>20</sup> independently represents a monovalent inorganic or organic group.

13. A polymerizable composition according to claim 1, wherein a mixing ratio of structural units that have the acid groups relative to total structural units contained in the binder polymer is in a range of from 5 to 70 % by mole.

14. A polymerizable composition according to claim 1, wherein a mixing ratio of structural units that have the radical addition polymerizable groups relative to total structural units contained in the binder polymer is in a range of from 5 to 95 % by mole.

15. A polymerizable composition according to claim 1, wherein the radical-generating compound contains at least one selected from the group consisting of an aromatic iodonium salt, an aromatic sulfonium salt, a titanocene compound, and a trihalomethyl-S-triazine compound represented by the following general formula (17):

General formula (17)



wherein in general formula (17), X² represents a halogen atom; Y¹ represents -C(X²)₃, -NH₂, -NHR³⁸, -NR³⁸, or -OR³⁸; R³⁸ represents an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group; and R³⁷ represents -C(X²)₃, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, or a substituted alkenyl group.

16. A polymerizable composition according to claim 1, further comprising a radical polymerizable compound.

17. A polymerizable composition according to claim 16, wherein a mixing ratio of the binder polymer to the radical polymerizable compound is in the range of 1:0.05 to 1:3 by weight.

18. A negative-working planographic printing plate precursor, comprising a support having a recording layer containing a polymerizable composition provided thereon, wherein the polymerizable composition comprises:

a binder polymer containing an acid group having an acid dissociation constant ( $pK_a$ ) of 5.5 or more and a radical addition polymerizable group; and

a radical-generating compound capable of generating radicals with light or heat.